

Functionalized optical fiber ball-shaped biosensor for label-free, low-limit detection of IL-8 protein: supplement

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Functionalized optical fiber ball biosensor for label-free detection of IL-8 protein: supplemental document

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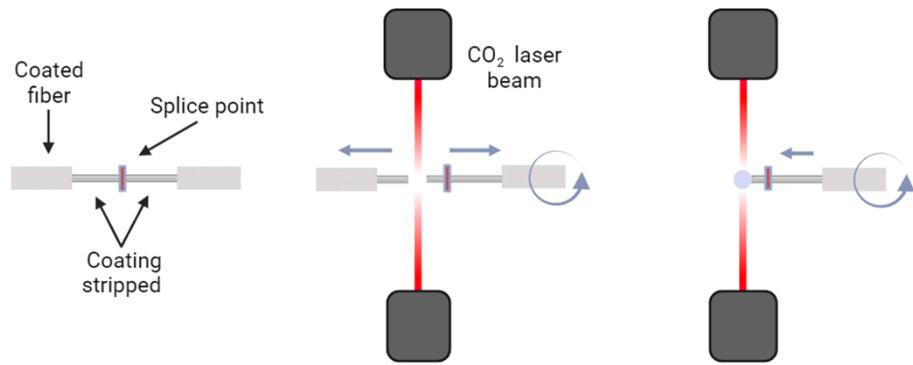


Fig. S1. Overview of the fabrication process of ball resonator sensor using single-mode fiber on a CO₂ splicing machine (Fujikura LZM100)

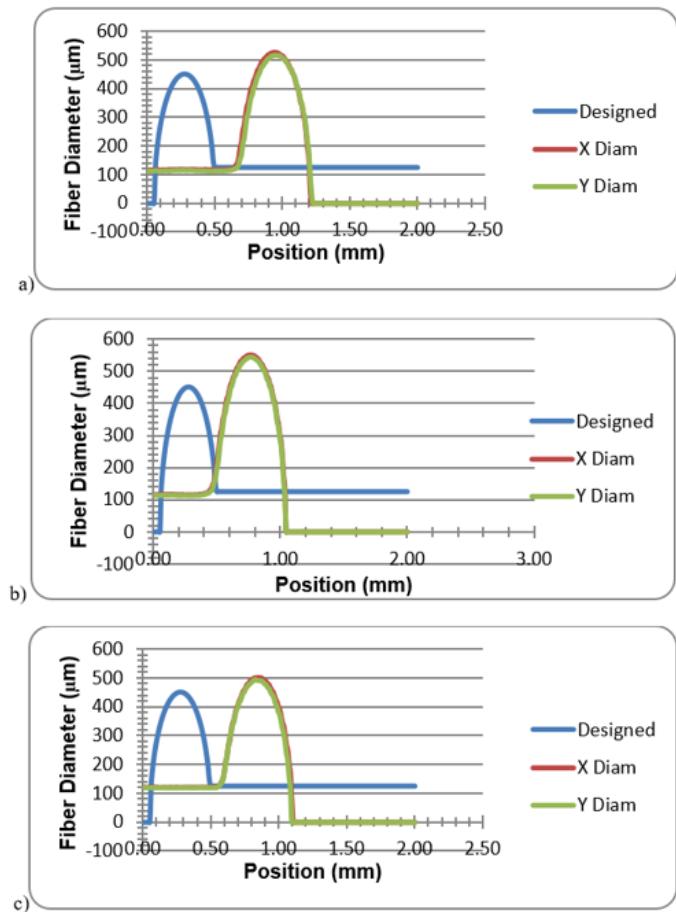


Fig. S2. Profilometry of two-sided fiber optic spherical tips for protein detection.
 a) 524-516 μm . b) 551-544 μm . c) 501-494 μm

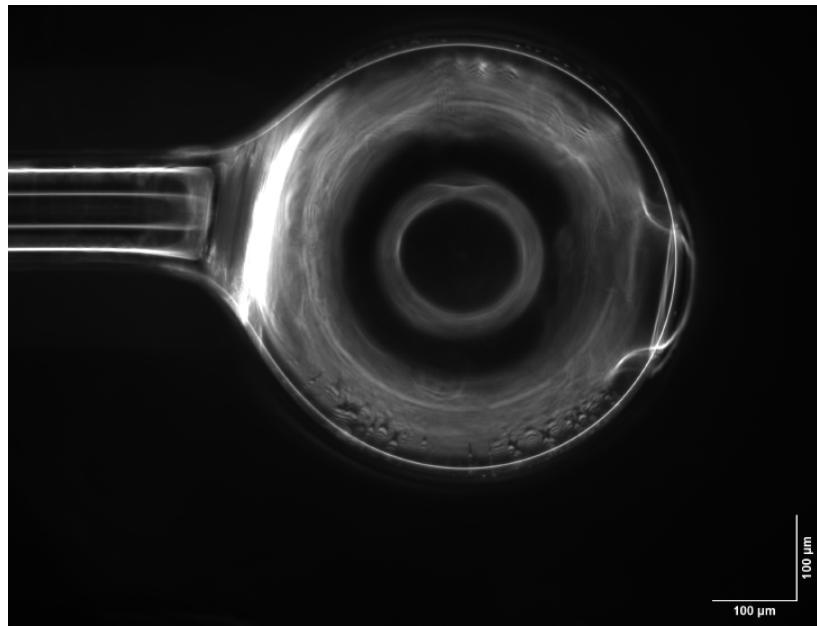


Fig.S3. A microscopic image of the tip of a ball resonator sensor.

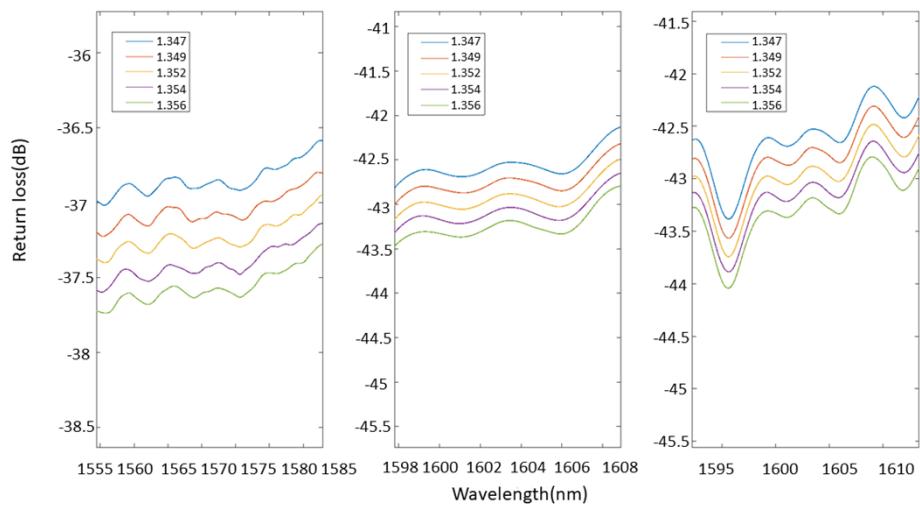


Fig. S4. Reflection spectra for three ball resonators demonstrating return loss in the 1555 -1610 nm range. Sucrose solutions with RI values ranging from 1.347 to 1.356 were used to probe the sensing unit. Diameters of ball resonators: (a) 524-516 μm (b) 551-544 μm (c) 556-546 μm

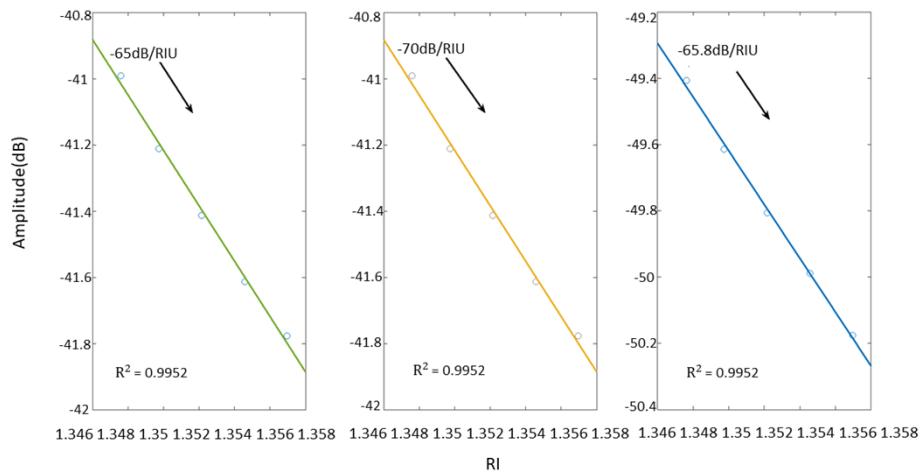


Fig.S5. Spectral amplitude response of three sensors for RI values ranging from 1.347 to 1.356. The slope of linear regression was used to calculate sensitivity in dB/RIU. All sensors show a linear trend with $R^2 > 0.99$. Diameters of ball resonators: (a) 524-516 μm ; (b) 551-544 μm ; and (c) 556-546 μm

Table S1. Commercially available ELISA kits for human IL-8 protein detection

#	Kit manufacturer	Calibration range	Sensitivity	Samples
1	Thermo Fisher scientific Cat #BMS204-3	15.6-1,000 pg/mL	2.0 pg/mL	Amniotic fluid, plasma,serum
2	Thermo Fisher scientific Cat #A35575	0.0128 – 5000 pg/mL	0.01 pg/mL	
3	Thermo Fisher scientific Cat # KHC0081	15.6-1000 pg/mL	5 pg/ml	Supernatant, plasma, serum
4	Thermo Fisher scientific Cat #KAC1301	7-750 pg/mL	0.7 pg/ml	
5	Thermo Fisher scientific Cat #KHC0084	0.39-25 pg/mL	100 fg/ml	
6	Abcam	3.91 pg/ml - 250 pg/ml	1.8 pg/ml	Cell culture supernatant, Cit plasma, EDTA Plasma, Hep Plasma, Serum
7	R&D Systems	31.2 - 2,000 pg/mL	7.5 pg/mL	Cell Culture Supernatant, Serum, EDTA Plasma, Heparin Plasma, Citrate Plasma
8	RayBiotech	1 pg/ml - 600 pg/ml	1 pg/ml	Cell Culture supernatant, plasma, serum
9	Proteintech	15.6-1000 pg/mL	1 pg/ml	Serum, Plasma, Cell culture supernatants
10	Elabscience	7.81-500 pg/mL	4.69 pg/mL	Serum, Plasma and other biological fluids